

## **Seminar Syllabus and Schedule: Arctic Field Ecology 4842**

### *Calendar of Seminars and Events*

#### **How to use the seminar schedule**

This schedule and seminar outline are designed to let you know what we have planned at various times during the course. This is subject to change as we make accommodations for the weather and the terrain.

Following each seminar title you will find a brief description of the seminar and what we hope to accomplish by presenting that particular material. The overview/lecture will usually be presented in the morning prior to lunch.

#### **Text for class**

A Naturalist's Guide to the Arctic

E.C. Pielou, 1994.

The University of Chicago Press, Chicago 60637

ISBN 0-226-66814-2

Library call number: QH84.1.P54

Dr. Pielou is a resident of British Columbia. She is a distinguished ecologist who has received numerous awards and has been a professor at universities in Canada, the U.S. and Australia. We will provide you with a copy of the book.

#### **June 20-21. Meeting in Yellowknife**

Staff and students should plan to arrive on June 20th. Students should arrive no later than June 21st.

We will leave early on the morning of the 22nd for the Hiukitak River. We will be camped the nights of the 20th and 21st at the Fred Henne campground across from the airport in Yellowknife.

We will be making last minute preparations on June 20 and 21. All services are available in Yellowknife and there is plenty to do and see. Students will be free to explore the unique surroundings of this northern town.

#### **June 22-24. Field skills**

We fly into the field on June 22nd and spend the first 3 days focused on camping skills and 1st aid. We will also have general ecology talks in the evenings and hikes to look at vegetation, wildlife, den sites, and interesting landscape features.

We initially focus on the field and camping skills as they will help to make the trip a positive experience for everyone. We do not make assumptions that everyone is bringing an equal amount of camping experience with them to the Arctic. We do not assume that people have had the experience of a month long, self-supported backcountry trip and so we will spend time going through a variety of tasks that quickly become routine. These include tent use and care, cooking equipment, stoves, food storage and preparation, boat loading and care, minimizing our impact on the land, keeping ourselves clean and healthy and general first aid skills. We will paddle a short distance on one or two of these days so that everyone can become familiar and comfortable with their boat. During these first few days we will have informal seminar/talks that will focus on a variety of research topics which are being conducted currently in the Arctic. We will also be taking hikes which will focus on the idea of tundra, the vegetation and the general ecology of the area.

### **June 25. Arctic Plant biology and ecology**

Students will be introduced to the local plant life through observation and collection.

The class is conducted north of the treeline and as expected there is not much tall, woody vegetation. However, vegetation cover is continuous and the species makeup is quite variable. Some of the species, genera or families will be familiar to some people and others will not. We will spend this seminar becoming familiar with the plants that live in the Arctic. A variety of topics will be covered including the following: differences between flowering and non-flowering plants, life histories and strategies of arctic plants, woody and non-woody plants, general ecology of arctic plants and specific adaptations to tundra life, how to use dichotomous plant keys, how to make plant collections and why one might need to make a plant collection even if one is not a botanist.

### **June 26. Plant community ecology and sampling**

We will examine what a plant community is and is not, why sample one and how to sample one. We will also discuss current literature and research topics in the Arctic.

In the Arctic plants are often associated with other plants in specific and recognizable units called "communities". These communities are often a function of slope, aspect, soil type and numerous other factors and are important in the study of

plants, animals, and people of the Arctic. We will spend the first portion of the seminar defining plant communities, reasons for studying them and present several techniques used to sample vegetation. The techniques and tools we will present include the Buchner sampler, point frame, line transect and relevé. We discuss the pros, cons, and biases introduced by the different techniques.

### **Current research in the Arctic**

We bring an extensive library of current research literature with us on the trip. We will regularly assign readings and discuss research papers of interest.

Topics include:

*Global change research:* Potential influences of climate and land-use change.

*Arctic transitions:* Extrapolating what we know in space and time - from field measures to modeling.

*Biocomplexity:* Understanding complex biological systems in the Arctic.

*Caribou research:* Migration, climate, vegetation, and hunting.

### **June 27. Relevé method: describing plant communities**

This seminar will focus and expand on the relevé method introduced in the previous seminar.

### **June 28. Soils and soil processes**

### **June 29. Periglacial landforms**

Glaciers retreated from the Bathurst Inlet area only a few thousand years ago and there is ample evidence of their former presence on the landscape. We will investigate hummocks, palsas, frost heaving, high and low centered polygons, eskers, isostatic rebound concepts, pingos, mass wasting, solifluction lobes and processes and other periglacial features the landscape can show us.

### **Introduction to research design**

Additionally, One of the major foci of the class is the nature of the research question and how to generate and hone hypotheses.

We will use our observations and curiosity in the field as a springboard for generating and discussing new research ideas. We will discuss how one goes from generating questions to refining research proposals to accomplishing research in ecology. You will be asked to generate your own set of original research questions and we will refine these throughout the course of the trip.

We will also review the research methods each student investigated as part of the pretrip assignment.

**June 30. Split camp and Generating research questions**

On the split days students and staff camp separately. We will stop at a spot where the students set up camp, instructors will then paddle a short distance and set up a separate camp. Students will work on generating and refining research questions.

**July 1. First exam and Presenting research ideas**

We will have a short exam followed by presentation and discussion of research questions generated the previous day.

**July 2. Traditional Ecological Knowledge (TEK)**

This seminar will focus on the Inuit people who live in the Arctic and providing background on TEK, how it is similar and how it differs from western science.

**July 3. Carbon cycling: decomposition**

We will look the role of soil organisms role in decomposition in the Arctic and extract soil fauna from cores sampled along a toposequence.

**July 4. Working with field samples: getting the most from your field season**

This seminar will focus on the problems and methods of data and sample collection. The quality and success of a field expedition is dependent on getting the complete set of samples and data safely back to the lab.

**July 5. Vertebrate ecology**

We will examine the diversity of birds, mammals, and fish in the region and focus on the ecology of caribou. We may sample the distribution of birds and small mammals relative to vegetation and landforms along the riparian corridor. We will discuss current issues in wildlife research.

**July 6. Insect ecology**

We will look at the diversity of insects in the Arctic and measure their abundance in a variety of habitats.

**July 7. Hierarchical controls on landscape patterns: Climate, substrate, topography**

We will sample vegetation, soils, and soil insects along a toposequence. Putting many of the skills we have learned to use.

**July 8. Split camp and Generating research questions**

Format will be as on the first split day, students should prepare for presentation on July 9 concerning research project.

**July 9. Second exam and Presenting research ideas**

We will have a short exam followed by presentation and discussion of research questions generated the previous day.

**July 10. Arrive at coast of Arctic Ocean in Bathurst Inlet**

Local Inuit experts in wildlife and traditional ecological knowledge will be joining us for several days and conducting informal seminars on mammals, birds, general wildlife ecology and traditional Inuit life in the north.

**July 11.** Final research project assignment. TEK seminars with Sandra Eyegetok and Lena Kamoayuk.

**July 12.** Final projects and TEK seminars with Sandra Eyegetok and Lena Kamoayuk.

**July 13.** Final projects and TEK seminars with Sandra Eyegetok and Lena Kamoayuk.

**July 14.** Final projects and TEK seminars with Sandra Eyegetok and Lena Kamoayuk.

**July 15.** Final project presentations.

**July 16.** Course ends in the morning. Grading and final day activities.

**July 19.** Fly from Umingmaktuuq to Yellowknife.